

## SOME NEW SIPHONAPTERA.

(Plates XIII. XIV.)

BY THE HON. N. C. ROTHSCHILD, M.A.

1. *Pulex roberti* spec. nov. (Pl. XIII. fig. 1. 2).

**T**HIS species is allied to *P. australis* Rothsch., but can be distinguished by the following characters:—

**Head.**—The rostrum and the second segment of the maxillary palpus are longer, the latter being more than twice the length of the third segment.

**Thorax.**—The sternum of the mesothorax bears two bristles instead of one.

**Abdomen.**—The first three tergites bear two complete rows of bristles. The anterior row becomes gradually reduced on the other tergites, especially in the ♂.

**Legs.**—All the femora bear on the outer side three bristles ventrally near the apex, and one on the inner side. On the outer side of the hindfemur there are five or six lateral bristles placed irregularly on its apical third. Anteriorly to these there is a row of three or four bristles, this row being separated from the three subapical ventral bristles by a wide interspace. On the inner side the hindfemur bears only one or two lateral bristles. The tibia have on the outer side very numerous bristles, as is the case in *Pulex bohlsi* Wagn. On the inner side of the hindtibia there are two or three bristles. The sixth dorsal incision of the hindtibia is rudimentary, however, one of the two bristles situated in this incision in other *Pulicidae* being present. The fourth incision (which is homologous to the fifth of other species) is not so deep in the present species as it is in *P. australis*. The tarsi, which in *P. australis* and *P. cleophontis* Rothsch. somewhat resemble the tarsi of *Malacopsylla* (= *Megapsylla*), are more normal in the present species. The second segment of the foretarsus is nearly three times as long as it is broad, being much longer than the first. The mid- and hindtarsi bear numerous hairs on the ventral surface. The apical spines of the tarsi are stout, except on the fourth segment. The longest apical spine of the first hindtarsal segment reaches to the subapical spine of the second, and the corresponding spine of the latter segment almost extends to the apical spine of the third. The first hindtarsal segment is two-thirds the length of the tibia. The fifth segment bears four lateral bristles and a ventral mesial row of about four hairs, besides a pair of apical ventral spine-like bristles. The claw is smaller than in *P. australis* and *P. cleophontis*. The measurements of the mid- and hindtarsi are as follows:—

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus, ♂ . . .	15	20	13	7	17
"    ♀ . . .	20	27	15	7	19
Hindtarsus, ♂ . . .	50	36	22	11	22
"    ♀ . . .	59	42	24	11	24

**Modified Segments.**—The finger is longer and slenderer than in *P. australis*. The manubrium (Pl. XIII. fig. 1. m) is broader. The ninth sternite (ix. st.) is also broader, and bears many more hairs. The eighth tergite of the ♀ (Pl. XIII. fig. 2)

has about half a dozen bristles above the stigma, one of them being stout. The bristles at the ventral edge of this tergite are more numerous than in *P. australis*. The anal sternite is longer than in *P. australis*, and the stylet somewhat thinner.

*Pulex bohlsi* Wagn., which we only know from Dr. Wagner's description and figure, is a similar insect. The present species, however, differs from it in having the second segment of the maxillary palpus and the end-segment of the rostrum longer. The mesothoracical sternum bears in *bohlsi* three bristles, and the epimerum of the mesothorax six. The bristles on the hindfemur and those on the eighth abdominal section are different in position; the first foretarsal segment of *P. bohlsi* is practically the same in length as the second, and the apical spines on the metanotum and first abdominal tergite are larger in number in *P. bohlsi* than in the present species.

Length: ♂, 2.4 mm.; ♀, 3 mm.

We have nine examples of this species collected by Mr. A. Robert, as follows:—

6 ♂, Sao Paulo, Brazil, November 22, 1901. *Didelphys aurita*.  
3 ♀, " " " " 24 " *Nictomys squamipes*.

## 2. *Pulex scopulifer* spec. nov. (Pl. XIII, fig. 5).

**Head.**—The frons is not notched. There is a vertical row of three eye-bristles, two of the bristles standing in front of the eye and the third at the genal edge. The occiput bears two bristles above the antennal groove and a complete subapical row of hairs, besides the usual row of short bristles placed along the antennal groove. The rostrum reaches to the apex of the forecoxa.

**Thorax.**—Each of the thoracical nota bears one row of bristles. The mesothorax bears one bristle on the sternum and four on the epimerum. The metathoracical epimerum has two vertical rows of bristles, the first containing eight, the second five to seven.

**Abdomen.**—There is one row of bristles on each tergite, except on the first, where there are two rows. On the seventh tergite there is a single apical bristle placed on a cone which projects far beyond the edge of the segment—a character peculiar to this species. The cone bears a minute hair on each side. The first sternite bears one ventral bristle on each side, while there is a row of four or five on the following four sternites, the sternite of the seventh segment bearing a row of seven or eight, with an additional bristle in front of them. The stigmata are rounded, and are placed above the first bristle.

**Legs.**—The mid- and hindcoxae bear two bristles posteriorly at the apex. There is a comb of four to six spines on the inner side of the hindcoxa. The hindfemur is obtusely angulate ventrally towards the base. It bears on the outer side two subventral bristles near the apex, and on the inner side a subventral row of four, of which two are placed before the middle and two farther back. On the outer side of the hindfemur there are two rows of bristles, the more dorsal row being incomplete. There are also two thin hairs at the ventral edge of the hindfemur in addition to the apical and subapical ventral bristles. The dorsal bristles of the tibiae are stout. One of the subapical hairs of the foretibia is short, very heavy, and blunt. The longest apical bristle of the foretibia is not so long as the tibia is broad. The longest bristle of the fifth pair of bristles of the hindtibia is hardly longer than the tibia is broad. The first foretarsal segment is a little shorter than the second. The longest apical bristle of the hindtarsus reaches

nearly to the apex of the second segment, and the longest of the latter extends to the base of the fifth segment. The fifth segment of the foretarsus bears three apical ventral bristles, of which the middle one is long and the other two are short and stout. On the mid- and hindtibiae these bristles are represented by only two thinner ones, the posterior lateral bristle being absent. The measurements of the mid- and hindtarsi are as follows :—

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus . . .	12	14	9	6	15
Hindtarsus . . .	35	24	14	9	19

**Modified Segments.**—The large eighth sternite bears about twenty-five bristles on each side. The clasper (Pl. XIII. fig. 4) has two free processes; the one (r) is finger-shaped, bearing some minute hairs at the edge, while the other (r) is short and covered with very heavy bristles. One of these bristles is rather strongly bent. The manubrium is slender and linear, being slightly bent downwards at the apex. The ninth sternite (ix. st.) is somewhat razor-shaped, being truncate at the apex. It bears a number of minute hairs, as shown in the figure. The spiral of the penis forms two-thirds of a whorl only. At the apical edge of the ninth tergite (bearing the sensory plate) there are laterally three bristles, two of which are long.

Length : 2 mm.

This species is easily recognised by the prominent cone on which the apical bristle of the seventh abdominal tergite is placed, and by the sexual armature.

We have one ♂ example of this species from *Saccostomus campestris*, collected by Mr. C. H. B. Grant at Umfolozi, Zululand, on July 1st, 1904.

### 3. *Ceratophyllus calceatus* spec. nov. (Pl. XIII. fig. 3. 4).

**Head.**—The frontal tubercle is very distinct. There is a row of three eye-bristles and above them two additional bristles, besides some short hairs. The occiput bears in or behind the middle two lateral bristles, one above the other, and a subapical series of hairs. This series is widely interrupted, the interspace between the first and second bristles being twice the width of the interspace between the second and third. The eye is ovate in shape. The club of the antenna is three times (♂) or twice (♀) as long as it is broad. The rostrum reaches a little beyond the apex of the forecoxa. The first segment of the labial palpus is longer than the second, while the second, third and fourth are about equal in length. The fifth segment is longer than the third and fourth taken together.

**Thorax.**—The pronotum is a little longer dorsally than the dorsal spines of the comb. It bears one row of bristles and a comb of nineteen (♂) or twenty (♀) spines. The mesonotum bears two rows of bristles and on the back some additional hairs, besides an irregular double row of small hairs at the base. There is also a subapical series of four to six slender spines on each side. The mesothoracal sternum bears four bristles laterally in the centre and some minute hairs near the upper angle. The epimerum of the metathorax bears six bristles (3. 2. 1). There are two rows of bristles on the metanotum, besides two or three hairs on the back in front of them. There is also one short apical spine on each side. The episternum of the metathorax bears two bristles and a small hair, the latter not being always present, and the sternum has a single bristle. The bristles of the metathoracal epimerum are seven in number (3. 3. 1).

**Abdomen.**—All the tergites bear two rows of bristles. The second row, which contains seven bristles on each side on tergites 2 to 7, is curved, especially in the ♀. The seventh tergite bears in the ♂ one subapical bristle accompanied by a small hair on the ventral side, but in the ♀ there are two long bristles similarly placed. These bristles stand at some distance from the apical edge. The first sternite bears one ventral bristle. The following four sternites have in the ♂ a row of two or three and in the ♀ a row of three or four hairs, the fourth being much shorter than the others. There are also one or two hairs in front of this row in the ♀. On the sternite of the seventh segment there is a row of five or six bristles, with two shorter hairs in front.

**Legs.**—The mid- and hindcoxae have two bristles posteriorly at the apex. The hindfemur bears on each side one subventral bristle near the apex, and on the inner surface towards the base another small bristle. The mid- and hindtibiae bear no hairs at the anterior (or ventral) edge, except the apical and subapical bristles. There is one row of lateral bristles on the outer side of these tibiae, and on the inner side of the hindtibia also a row of four to six bristles. The first hindtarsal segment has three lateral pairs of bristles on the anterior side, and four to six on the posterior. Near the posterior lateral bristles there are on this segment from one to three bristles. The longest apical bristle of this segment reaches a little beyond the base of the subapical pair of the second segment. The longest apical bristle of the second segment does not reach the apex of the third. The fifth segment is broad. It bears four lateral bristles, besides a subapical hair, and there is also a ventral pair of bristles in between the first lateral pair. The measurements of the mid- and hindtarsi are as follows :

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus, ♂ . . .	19	17	14	9	19
" ♀ . . .	23	20	13	10	19
Hindtarsus, ♂ . . .	45	30	22	12	20
" ♀ . . .	50	31	21	11	20

**Modified Segments.**—The eighth tergite of the ♂ is large. It bears a number of small hairs above the stigma. At the apical edge there are five or six long bristles and on the lateral surface seven or nine more. The eighth sternite is small but quite distinct (Pl. XIII. fig. 4, viii. st.). The process of the clasper (Pl. XIII. fig. 4, v) is rounded, bearing two small hairs at the top. The finger (F) is shaped like an inverted boot, the dorsal edge representing the sole. It bears a bristle at the apex and three more at the ventral edge, besides a short hair situated near the upper proximal angle. There are two very long bristles at the junction of the finger with the clasper. The ninth sternite (ix. st.) bears an elongate-ovate apical flap, which is widest at the apex. We cannot make out the exact outline of this sternite. The seventh sternite of the ♀ is obtuse, being obliquely rotundate-truncate (Pl. XIII. fig. 3, vii. st.). The eighth tergite (viii. t.) bears a number of short hairs above the stigma and a long bristle and three short hairs near it. The segment is emarginate at the apex, with the ventral angle somewhat more projecting and less rounded than the upper angle. There are at the apical edge three bristles and one short spine-like hair. Proximally of these there are three more bristles, and farther down and still more proximal six additional ones. The eighth sternite (viii. st.) is very narrow and long. It is rounded at the apex (lateral

view), and bears at the apical edge some extremely fine and short hairs. The stylet is about three times as long as it is basally broad. The anal sternite bears on each side two long apical bristles and some stout ventral ones, besides numerous thin hairs.

Length: ♂, 3.2 mm.; ♀, 3.6 mm.

We have one pair of this species from Bukit Besar, 2500 ft., State of Nawngchik, Eastern Malay States, May 15th, 1901, from *Sciurus nigrovittatus*, kindly sent to us by Mr. H. Robinson.

#### 4. *Ceratophyllus robinsoni* spec. nov. (Pl. XIII. fig. 6).

♀. Allied to *C. ahalae* Rothsch., but differs in the following characters:—

**Head.**—The frontal part of the head bears a few less bristles. The subapical row of bristles of the occiput is widely interrupted, the second bristle of that row not being developed. The rostrum reaches to the apex of the forecoxa.

**Thorax.**—The pronotum bears a comb of twenty teeth. The metanotum has three rows of bristles, and in front of them some dorsal bristles representing a fourth row.

**Abdomen.**—There are two long apical bristles on the seventh tergite, placed on a double cone. Below them there is a third bristle, not situated on a cone. Tergites 2 to 7 bear on each side one rather long black apical spine, and tergite 5 one spine on one side only. The basal sternite bears about ten short hairs laterally near the base and three bristles at the ventral edge, the posterior bristle being the longest. The sternites of segments 3 to 6 have a row of four long bristles and eleven to fifteen shorter bristles in front of the row, the bristles being still more numerous on the seventh segment. The seventh sternite bears a deep and narrow sinus (Pl. XIII. fig. 6, vii. st.). The stigmata stand in front of the middle row of bristles. They are situated on a level with the third long bristle of the posterior row or above the second bristle, except on the second and seventh tergite, where the posterior row of bristles extends less far downwards.

**Legs.**—The first foretarsal segment is shorter than the second. The lateral bristles of the fifth segment are thinner than in *C. ahalae*, and there are only two short spine-like bristles ventrally at the apex of the fifth fore- and midtarsal segments instead of four.

The measurements of the tarsi are as follows:

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus . . .	21	22	14	8	17
Hindtarsus . . .	73	49	26	14	21

**Modified Segments.**—The eighth tergite (Pl. XIII. fig. 6, vii. t.) bears a few short hairs above the stigma and none below it. The ventral apical angle is produced. Above this projection there are two pairs of bristles, and farther back about fourteen more bristles. The eighth sternite bears a few minute hairs at the apex. The stylet is slightly conical, being about four times as long as it is broad. It bears one long bristle at the apex accompanied by two very minute hairs. There is one bristle at the corner of the tergite, beneath the stylet. The anal sternite bears long bristles only, nine in number.

Length: ♀, 4 mm.



We have one specimen of this species from Bukit Besar, 2500 ft., State of Nanggehik, Eastern Malay States, May 17th, 1901, from *Seiurus nigrovittatus*.

We are indebted to Mr. H. Robinson for this species.

### 5. *Ceratophyllus vicinus* spec. nov. (Pl. XIII. fig. 7).

Closely allied to *C. agrippinae* and *C. dorippae* Rothsch., but distinguished by the following characters:—

**Head.**—The rostrum is shorter than in the species mentioned and the relative lengths of the segments different, the last segment being twice the length of the last but one. The eye is vestigial. It has no pigment.

**Thorax.**—The pronotal comb consists of twenty-four spines in the ♂ and twenty-eight in the ♀.

**Abdomen.**—The numbers of apical spines on the tergites are as follows: 17, 12, 7, 5, 1.

There is no bristle beneath the stigma on tergites 5 to 7. The seventh tergite bears three apical bristles in both sexes. The sternites of the present species have one or two bristles less than those of *C. agrippinae*.

**Legs.**—The hindfemur bears five to seven bristles at the ventral edge behind the basal sinus, instead of the one pair found in *C. agrippinae*. There are two ventral subapical bristles on the outer side, as in *C. agrippinae*. The first hindtarsal segment is proportionally much longer than in *C. agrippinae*, the proportions being almost the same as in *C. dorippae*. The first and second midtarsal segments are shorter than in *C. dorippae*. The measurements of the mid- and hindtarsi are as follows:

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus, ♂ . . .	26	15	10	8	17
„ ♀ . . .	30	18	12	9	19
Hindtarsus, ♂ . . .	52	34	15	10	18
„ ♀ . . .	55	38	17	11	20

**Modified Segments.**—The eighth sternite of the ♂ bears only eight bristles above the sinus and two short ones farther back, besides six to eight below the sinus. The two processes of the clasper (Pl. XIV. fig. 7) are of nearly the same length, while in *C. agrippinae* the second process is much the longer of the two. The finger is very much broader in the new species, and bears a heavy bristle at the ventral edge near the base (f). The manubrium is pointed. The seventh sternite of the ♀ is more distinctly emarginate than in *C. agrippinae*.

We have a pair of this species from *Herpestes badius*, collected by Mr. C. H. B. Grant at Wakkerstroom, Namaqualand, Cape Colony, March 1904.

### 6. *Ceratophyllus stratiotes* spec. nov. (Pl. XIV. fig. 8).

**Head.**—The frons is notched. There are three long bristles before the eye, which are placed in an obtuse triangle some distance from the eye. Between the second bristle and the oral edge there is further a short bristle, and above the third bristle two more. The occiput bears one lateral bristle and a widely interrupted subapical series, the second bristle of this row not being developed. The small hairs along the antennal groove stand rather far apart. The eye is evenly rounded

anteriorly. The rostrum reaches almost to the apex of the forecoxa. The last segment is nearly twice the length of the last but one. The first antennal segment bears numerous small hairs at the apex. The club is about four times as long as it is broad, the segments being sharply separated.

**Thorax.**—The pronotum bears one row of bristles and a comb of twenty-one teeth. There are three rows of bristles on the mesonotum, besides some additional short dorsal bristles and a basal row of rather long thin hairs. Three long slender subapical spines are placed on each side. The sternum bears a nearly horizontal row of three bristles in the middle and some short hairs near the upper corner. On the epimerum there are eleven bristles. The metanotum, which is shorter than the mesonotum, possesses one apical spine on each side and three rows of bristles, the anterior row being quite irregular. The episternum and sternum have each one bristle, while there are ten on the epimerum.

**Abdomen.**—The first tergite bears four rows of bristles, the other tergites two, with some additional bristles representing a third. The number of spines on the two sides together are : 2. 4. 2. 2. 2. The seventh tergite bears two long stout apical spines placed on a double cone. Proximally of, as well as below them, there are a few hairs. The stigmata are round, and stand above the first bristle of the posterior row. There is no bristle on the basal sternite. The following sternite bears two bristles and the next three sternites three, all having two shorter ones in front of them. On the sternite of the seventh segment there is a row of three long bristles, with three additional shorter ones in front.

**Legs.**—The bristles of the mid- and hindcoxae are few in number. There are two posteriorly at the apex. All the femora bear a small subventral hair near the apex on both sides, and a minute lateral hair near the base on the outer surface. There is on the hindfemur also a minute ventral hair behind the subbasal sinus. The mid- and hindtibiae bear at the ventral edge three hairs besides the apical and subapical ones, and there are on the outer and inner sides one row of bristles. There are no bristles on the ventral surfaces of the mid- and hindtarsi, apart from apical bristles. The lateral bristles are short. The longest apical bristles of the first hindtarsal segment reaches the middle of the second segment. The fifth segment is broad. It bears five pairs of lateral bristles, the first pair being strongly and the third less strongly dislocated towards the middle. The measurements of the mid- and hindtarsi are as follows :—

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus . . .	21	17	11	7	20
Hindtarsus . . .	58	34	23	13	22

**Modified Segments.**—The eighth tergite is large and apparently\* triangular. It bears about fourteen bristles at the edge from the stigma backwards, and about as many on the side. There is a single long bristle near the ventral margin behind the middle. The process of the clasper (Plate XIV., fig. 8, *r*) is very short and obtuse, while the finger is long and slender (*r*), bearing some minute hairs at the edge, as shown in the figure. The two bristles at the junction of the finger with the clasper are long and placed some distance apart. The manubrium (*m*) is also

\* The single example of this species we possess is mounted as a microscopic slide, and is consequently somewhat distorted in shape.

very slender, and is slightly dilated at the apex. The ninth sternite (ix. st.) is broad; it is sinuate beyond the middle, with the distal angle of the proximal portion somewhat projecting distad.

Length: ♂, 3.7 mm.

We have one ♂ of this species from the Benito River, Spanish Gaboon, collected by Mr. W. Bates. The host is not known to us. We are indebted to Mr. W. de Winton for the specimen.

### **Macropsylla** gen. nov.

♀. Closely allied to *Hystrichopsylla*. The rostrum consists of eleven to thirteen segments in the only species known. There is a row of spines situated along the ventral edge of the head as well as along the antennal groove (Pl. XIV. fig. 9). The eye is vestigial, situated at the base of the uppermost spine. The chitin of the occiput is internally thickened in the middle, as indicated in the figure. The episternum of the metathorax is about twice as long as it is broad. The fifth tarsal segment has four lateral bristles, besides a thin subapical hair, and a ventral pair of bristles in between the first lateral pair. There are two bursal copulatrices, as in *Hystrichopsylla*. The eighth sternite is absent, while the tergite is completely divided dorsally in the mesial line.

The posterior angle of the gena, underneath the antennal groove, has developed into a spine (Pl. XIV. fig. 8). This spine corresponds to the posterior row of genal spines met with in *Stephanocircus*, while the continuous row of spines extending in *Macropsylla* from the anterior oral corner to the vestigial eye is homologous to the row of spines situated along the hinder edge of the helmet in *Stephanocircus*.

#### 7. **Macropsylla hercules** spec. nov. (Pl. XIV. fig. 9, 10).

**Head.**—The frons (Pl. XIV. fig. 9) is quite different in outline from that of *Hystrichopsylla*, being rounded as far down as the first genal spine. There are six genal spines at the ventral edge and three at the edge of the antennal groove. The genal process beneath these spines is also armed at the apex with a short broad spine. The frons bears seven long bristles, and is covered, moreover, with numerous short hairs. The occiput bears four rows of bristles, and above the antennal groove a row of short hairs. The space in front of and above the first row of bristles is punctured. The rostrum does not quite reach to the apex of the forecoxa. The maxillary palpus is much shorter than in *H. talpac*, but the proportional length of the segments is about the same as in that species.

**Thorax.**—The pronotum bears three rows of bristles and a comb of twenty-eight to thirty-four spines, besides some additional bristles in front of the first row. The mesonotum is very hairy, bearing four rows of bristles and numerous shorter hairs situated between these rows and the base. There are dorsally before the apex two long slender spines on each side. On the sternum of the mesothorax there are about thirty bristles, most of them standing in the upper half, and there are about eighteen on the epimerum. The metanotum bears four rows of bristles. There are two vertical rows of bristles on the episternum, with two additional bristles in front, the epimerum bearing about twenty-seven bristles, the middle and posterior ones being arranged in two vertical rows.

**Abdomen.**—There is a comb on segments 2 to 5, the first three combs



being uninterrupted on the back, while the fourth comb is slightly interrupted by small dorsal mesial interspace; the numbers of teeth are 43, 44, 47, and 41. The tergites 1 to 7 all bear four rows of bristles, the anterior row being quite irregular and partly doubled on tergites 2 to 7. There are three long apical bristles on the seventh tergite, the middle one reaching nearly to the apex of the last segment, the ventral one being only a little shorter, while the dorsal one is less than half the length of the middle bristle. The apex of this segment is produced between the two sets of apical bristles. The first sternite is very hairy on the sides and along the ventral margin. The following four sternites bear a row of four or five long bristles and a patch of shorter ones in front of them, these long and short bristles being more numerous on the seventh sternite. This sternite is broadly and shallowly emarginate.

**Legs.**—There are three bristles posteriorly at the apex of the mid- and hind-coxae. The hindfemur bears on the outer side a subventral row of about nine bristles and on the apical third of the outer surface about twenty bristles. The foretibia has no stout bristles laterally at the apex between the stout dorsal and ventral apical bristles as is the case in *Hystrichopsylla talpae*. The hindtibia has eleven or twelve dorsal incisions bearing stout bristles. The outer surfaces and ventral edges of the tibiae are hairy, while the inner surfaces are bare of hairs. The longest apical dorsal bristle of the midtibia reaches a little beyond the apex of the first tarsal segment, while that bristle of the hindtibia does not reach the base of the subapical pair of bristles of the first tarsal segment. The fifth tarsal segment is proportionally shorter than in *H. talpae*, and the dorso-lateral bristles of this segment are much longer. The measurements of the mid- and hindtarsi are as follows :—

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus . . .	58	36	21	15	24
Hindtarsus . . .	102	70	40	20	25

**Modified Segments.**—The eighth tergite (Pl. XIV. fig. 10) is triangular, with the apex rounded off. It bears very numerous bristles, as shown in the figure. The bristles are somewhat variable in number and position. The eighth sternite is apparently altogether absent. The plate belonging to the ninth segment, being situated between the eighth tergite and the sensory organ, is very distinct (Pl. XIV. fig. 10, ix. t.). The stylet is subcylindrical, becoming slightly narrower from the base to the apex.

Length : 5.2 mm.

We have two ♀ specimens of this species from Lannceston, Tasmania, one from *Mus velutinus* and the other from *Mus spec. ?*, both collected by Mr. A. Simson.

### **Uropsylla gen. nov.**

♀. The ventral margin of the head is dilated behind the palpus into a rounded lobe projecting downwards (Pl. XIV. fig. 11). This lobe bears two bristles which form a continuation of a row of three of which two are situated beneath the eye and one behind it. The eye is very large and stands at the antennal groove. The genal process is, immediately behind the eye, dilated into a truncate flap which partly covers the club of the antenna. The first segment of the antenna is very large,

being longer than, and as broad as, the club. It bears a large number of short hairs. The second segment is fringed with long hairs, which do not however reach to the apex of the club. The latter is globular and covered with minute hairs, the segments being separated from one another. The hairs are especially dense on the first and the last segments. The proximal surface of the first segment of the club has the appearance of being reticulated. There is no internal thickening of the chitin from the upper end of the antennal groove to the dorsal edge of the head. The pronotum is about four times as long dorsally as it is laterally, appearing almost hammer-shaped in side view. It bears a comb of long spines. The episternum of the metathorax is larger than the sternal plate when viewed from the side (as on the slide). The abdominal tergites 1 to 7 bear short, broad, triangular apical spines. There are *no* apical bristles on the seventh tergite. The eighth tergite is large. It is triangular, with the apical angle rounded off, the oblique distal margin being about half as long again from the stigma to the apex as the ventral margin from the apex to the base. The eighth sternite is small, triangular, and concealed in the tergite, being hairy at the upper and apical edges. The sensory plate is large, being about twice as long as it is wide. The anal segment is as long as the sensory plate. The fifth tarsal segment bears five lateral bristles, besides a thin apical hair. There are no fine hairs on the ventral surface of this segment. It bears, however, two short stout bristles at the apex, one placed obliquely behind the other, and proximally of them a pair of short slender hairs. There is one *bursa copulatrix*. The cavities into which the stigmata open are large and rounded.

The insect for the reception of which we have to propose the present genus does not fit into *Ceratophyllus* or any other genus. In respect to the triangular eighth abdominal tergite the insect resembles *Macropsylla*, described above, but in other respects the genera *Macropsylla* and *Uropsylla* are markedly different.

It is, of course, impossible to decide from one species which characters are of generic value and which only of specific. We have no doubt, however, that some of the very striking characteristics mentioned above will be found in other species, when the Australian Pnlicid fauna become better known.

#### 8. *Uropsylla tasmanicus* spec. nov. (Pl. XIV. fig. 11, 12).

**Head.**—The head (Pl. XIV. fig. 11) is about as high as it is long. It is evenly rounded in front. There is no frontal notch. In addition to the row of bristles situated beneath the eye there are two rows before the eye, and two more bristles above these, besides a number of short hairs situated above the eye. The occiput, which is punctured dorsally like the frons, bears a great number of small hairs from the base of the antennal groove to the middle of the same, and a regular row of rather stouter hairs from here to the ventral corner. There are laterally two pairs of bristles, and near the hinder edge a row of seven long bristles on each side. The rostrum does not reach to the apex of the forecoxa. The labial palpus consists of five segments, of which the first four are nearly of equal length, while the last is half as long again. The first segment of the maxillary palpus is longer than the fourth and half as long again as the second, the third being hardly half the length of the first.

**Thorax.**—The pronotum bears one regular row of bristles and a comb of thirty spines. The mesonotum is covered with short and rather stout hairs all over from the base to the postmedian row of long bristles. The episternum bears also many

similar hairs. The metanotum has four irregular rows of short stout bristles, besides additional dorsal hairs and a postmedian row of long bristles. There is a comb of seven short apical spines on the two sides together. The large metathoracic episternum bears dorsally a long bristle with a short hair below it, and anteriorly a vertical row of four to six more, and a ventral, nearly horizontal, row of three beside. There is one bristle on the sternum. The epimerum, which is very much higher than it is wide, bears a row of seven bristles anteriorly, another row of four from the stigma downwards, and two bristles in between the rows, besides two small hairs, one of which is placed above and one beneath the uppermost bristles of the second row.

**Abdomen.**—The tergites 1 to 7 bear two rows of bristles, the first and second tergites possessing in addition a short third row; this third row being represented by two or three bristles also on the third and fourth segments. Both rows of bristles extend down beyond the stigmata, except on the seventh segment. The number of apical spines on the tergites are on the two sides together: 7. 9. 11. 9. 6. 4. 2. The basal sternite bears on each side about twenty hairs and at the ventral edge a long bristle and more proximally several finer ones. The following four sternites bear a row of six long bristles and in front of them four to six shorter ones. The sternite of the seventh segment has a row of seven or eight bristles and six to eight hairs before this row.

**Legs.**—The mid- and hindcoxae bear posteriorly at the apex four or five bristles. The hindfemur has ventrally on the outer side a row of five long bristles from the apex forward, the row being continued anteriorly by two shorter bristles, which are preceded by two more bristles standing a little separate from the ventral edge. On the outer surface the hindfemur bears an irregular row of seven or eight bristles and a subdorsal row of four or five. The bristles on the outer side of the midfemur are a little less numerous. The mid- and hindtibiae have nine dorsal incisions. The sixth and apical incisions bear the longest bristles. The longest apical bristle of the midtibia reaches nearly to the middle of the second tarsal segment, while that bristle of the hindtibia extends to the apex of the first segment. There is one row of seven bristles on the inner side of the hindtibia and two and a half rows of bristles on the outer side, besides numerous hairs situated at and near the anterior edge. The first foretarsal segment is two-thirds the length of the second. The first and second segments of the midtarsus are almost equal in length, while the first hindtarsal segment is very much longer than the second. The apical and subapical bristles of the hindtarsus are stout and rather short, the longest apical bristle of the first segment not reaching to the apex of the second. The measurements of the mid- and hindtarsi are as follows:—

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus . . .	27	25	17	13	27
Hindtarsus . . .	58	35	26	15	30

**Modified Segments.**—The seventh sternite (Pl. XIV. fig. 12, vii. st.) is obliquely sinuate, the lobe above the sinus being rounded and the lobe below the sinus being slightly bi-emarginate. The eighth tergite is completely divided dorsally in the mesial line. It bears very numerous short hairs at the edge and on the lateral surface (Pl. XIV. fig. 12).

Length, 4.6 mm.

We have one ♀ example of this species from Launceston, Tasmania, from *Dasyurus vicerrinus*, collected by Mr. A. Simson.

♀. *Ctenopsyllus ellobius* spec. nov. (Pl. XIV, fig. 13, 14, 15).

**Head.**—The frons is evenly and strongly rounded, the lower portion sloping backwards, especially in the ♂ (Pl. XIV, fig. 13). There is a vertical row of five genal spines. The vestige of an eye is placed above the uppermost spine. The side of the frontal portion of the head bears one very long bristle, and several shorter ones, as shown in the figure. The occiput bears three oblique rows of bristles, besides the subapical row. The first antennal segment is large. The second is produced apically anteriorly, the projection extending in the ♀ beyond the middle of the club, and in the ♂ to the fourth segment of the club. The rostrum extends to the subapical row of bristles of the forecoxa.

**Thorax.**—The pronotum bears two rows of bristles and a comb of twenty-eight teeth. The mesonotum has two slender subapical spines on each side, and three rows of bristles, bearing numerous additional hairs, between the first row and the base. There are three oblique rows of bristles on the metanotum, and laterally near the base an irregular fourth row. The apex of the metanotum is denticulate. The epimerum of the metathorax bears four more or less irregular rows of bristles, twenty to twenty-three altogether.

**Abdomen.**—The tergites 1 to 6 are denticulate dorsally at the apex. The second to fifth bear laterally, not dorsally, short stout apical spines, which vary in number, there being in the ♂ on one side 6. 6. 9. 2, and on the other 6. 6. 6. 2, while in the ♀ the numbers are 4. 4. 6. 0, and 4. 4. 4. 0. There are four rows of bristles on all the tergites. The anterior row, however, is represented in the ♂ by a few dorsal hairs only. The stigmata are pointed behind, and stand on the middle segments above the third or fourth bristles of the last row, but much nearer the base of the segment. The seventh tergite bears three heavy apical bristles, the middle one being more than twice the length of the dorsal one. The basal sternite has a number of hairs at the ventral edge, and bears an oblique lateral row, the hairs in this row being more numerous in the ♀ than in the ♂. The sternites of segments 3 to 6 bear in the ♀ a row of four or five long bristles, in front of which there are three rows of shorter ones, the anterior row being irregular. In the ♂ the number of bristles is reduced, there being only one row before the long bristles, with some additional hairs in front, representing the two anterior rows of the ♀. The number of bristles is larger on the seventh sternite, especially in the ♀, which bears seven bristles in the last row.

**Legs.**—The hindcoxa, which is devoid of a comb of spines on the inner surface, has four bristles posteriorly at the apex. There is an irregular lateral row of minute hairs on the outer side of the forefemur, and two subapical ventral bristles, there being in the ♂ several additional small hairs above that row. The mid- and hindfemora bear ventrally near the apex on the outer side three bristles, and on the inner side one small hair. The outer side of all the tibiae is covered with hairs, these hairs being arranged in three or four irregular rows on the hindtibia. This tibia bears at the dorsal edge nine stout bristles of nearly equal length, four of them being accompanied by a long one. The bristles of the tarsi are numerous and rather stout. The longest apical one of the second hindtarsal segment does not



quite reach the subapical pair of the third segment. The fifth segment bears four lateral bristles and a subapical hair, besides a ventral pair standing in between the first lateral pair. The measurements of the mid- and hindtarsi are as follows :—

	First segment.	Second segment.	Third segment.	Fourth segment.	Fifth segment.
Midtarsus, ♂ . . . . .	30	21	13	8	18
„       ♀ . . . . .	35	24	14	9	18
Hindtarsus, ♂ . . . . .	53	40	22	13	20
„       ♀ . . . . .	60	45	24	14	20

**Modified Segments.**—The eighth sternite of the ♂ is very large, and bears about thirty bristles, besides some short hairs. The eighth tergite bears numerous short bristles on the back. The clasper, which is not separated from the tergite of the ninth segment by a suture, but is much more strongly chitinised than the portion of the segment between the clasper and the sensory plate, is not produced backwards, being oblique and bearing at the edge five long bristles (Pl. XIV. fig. 14, cl.). The finger is very long (f). It bears one stout, short, obtuse spine at the apex, and many minute hairs on the ventral edge, there being also some hairs on the dorsal edge. The manubrium (m) is very broad and curved upward apically, being an inner projection of the whole lateral and dorsal portion of the ninth segment, inclusive of the sensory plate. The ninth sternite (ix. st.) is club-shaped, and bears some bristles at the ventral edge, as shown in the figure. This sternite reminds one of that of *Hystriohopsylla talpae*, but the “boomerangs” of the two sides appear to be completely separated from one another. The anal segment is longer than the sensory plate, and conical, bearing numerous bristles. The seventh sternite of the ♀ is bi-emarginate, the upper sinus being wide and the lower small and very shallow (Pl. XIV. fig. 15, vii. st.). The eighth tergite (Pl. XIV. fig. 15, viii. t.) is very hairy above and below the stigma. The apex is bisinuate. The anal tergite is longer in the ♀ than in the ♂, and very bristly. The anal sternite is somewhat oblong, as in *Pulex irritans*, and bears very numerous and heavy bristles at the truncate apex. The stylet is subconical, being about six times as long as it is basally wide.

Length: ♂, 3.4 mm.; ♀, 4.2 mm.

We have four examples of this species collected by Mr. C. H. B. Grant, as follows :—

1 ♂, Sibdeni, Zululand, December 28, 1903. *Mus* spec.

2 ♂, Wakkerstroom, Namaqualand, Cape Colony, April 30, 1904. *Crocidura flavescens*.

1 ♀, Wakkerstroom, Namaqualand, Cape Colony, April 30, 1904. *Crocidura flavescens*.

#### ERRATA IN TWO PREVIOUS PAPERS ON SIPHONAPTERA.

VOL. XI. Page 653, line 6 from bottom, *read* Cowichan (Duncans), Vancouver Is.

VOL. XII. Page 168, lines 10 and 12 from top, *read* Carpenter's Mt., Cariboo District, B.C.

„ Page 170, line 12 from top, *read* Allan Brooks.